

Supplementary Online Content

Shields GS, Spahr CM, Slavich GM. Psychosocial interventions and immune system function: a systematic review and meta-analysis of randomized clinical trials. *JAMA Psychiatry*. Published online June 3, 2020. doi:10.1001/jamapsychiatry.2020.0431

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This supplementary material has been provided by the authors to give readers additional information about their work.

eMethods. Search Strategy

MEDLINE (PubMed) Search Strategy (2,941 articles):

((("cognitive therapy"[tw] OR "behavioral therapy"[tw] OR "behavioural therapy"[tw] OR "existential therapy"[tw] OR "interpersonal therapy"[tw] OR "relaxation therapy"[tw] OR "narrative therapy"[tw] OR "family therapy"[tw] OR "relationship therapy"[tw] OR "relational therapy"[tw] OR "emotion focused"[tw] OR "emotionally focused"[tw] OR "rational emotive"[tw] OR logotherapy[tw] OR "network therapy"[tw] OR "support group"[tw] OR "support groups"[tw] OR "reality therapy"[tw] OR "primal therapy"[tw] OR "persuasion therapy"[tw] OR "transactional analysis"[tw] OR "insight therapy"[tw] OR "gestalt therapy"[tw] OR "feminist therapy"[tw] OR "client centered therapy"[tw] OR sociotherap*[tw] OR milieu[tw] OR bibliotherapy[tw] OR ("art therapy"[tw] OR "arts therapy"[tw]) AND creative[tw]) OR "music therapy"[tw] OR "music listening"[tw] OR "autogenic training"[tw] OR "autogenic therapy"[tw] OR "autogenic relaxation"[tw] OR ("eye movement"[tw] AND (desensitization[tw] OR reprocessing[tw])) OR biofeedback[tw] OR "guided imagery"[tw] OR hypno*[tw] OR "stress management"[tw] OR counsel*[tw] OR "Counseling"[Mesh] OR meditat*[tw] OR "dream analysis"[tw] OR "morita therapy"[tw] OR cotherapy[tw] OR mirroring[tw] OR storytelling[tw] OR ((reframing[tw] OR paradoxical[tw]) AND technique[tw]) OR "empty chair"[tw] OR "role playing"[tw] OR improvisation[tw] OR "active listening"[tw] OR (motivational[tw] AND (interviewing[tw] OR therapy[tw])) OR psychoeducation*[tw] OR psychodynamic[tw] OR psychosocial[tw] OR psychodrama[tw] OR psychotherap*[tw] OR "Psychotherapy"[Mesh] OR "mind body therapy"[tw] OR "mind body therapies"[tw] OR "Mind-Body Therapies"[Mesh]) OR ((exercise[tw] OR "Exercise"[Mesh]) AND (psycholog*[tw] OR mental[tw] OR mood[tw] OR "Affect"[Mesh] OR depress*[tw] OR "Depression"[Mesh] OR anxiet*[tw] OR "Anxiety"[Mesh])))) AND (("Cytokines"[Mesh] OR cytokine*[tw] OR chemokine*[tw] OR interleukin*[tw] OR interferon*[tw] OR "tumor necrosis factor"[tw] OR "tumor necrosis factors"[tw]) OR ("Toll-Like Receptors"[Mesh] OR toll[tw] AND receptor*[tw])) OR ("NF-kappa B"[Mesh] OR NFkB[tw] OR ((NF[tw] OR "nuclear factor"[tw]) AND ("kappa B"[tw] OR kb[tw]))) OR ("Leukocytes"[Mesh] OR leukocyte*[tw] OR neutrophil*[tw] OR "LE cell"[tw] OR "LE cells"[tw] OR monocyte*[tw] OR lymphocyte*[tw] OR "natural killer cell"[tw] OR "natural killer cells"[tw] OR "NK cell"[tw] OR "NK cells"[tw]) OR ("C-Reactive Protein"[Mesh] OR "C reactive protein"[tw]) OR (cortisol[tw])) AND ((clinical[Title/Abstract] AND trial[Title/Abstract]) OR clinical trials as topic[MeSH Terms] OR clinical trial[Publication Type] OR random*[Title/Abstract] OR random allocation[MeSH Terms] OR therapeutic use[MeSH Subheading])) NOT (animals[Mesh] NOT humans[Mesh])

Scopus Search Strategy (excluding PubMed results: 537 articles):

(TITLE-ABS-KEY(("cognitive therapy" OR "behavioral therapy" OR "behavioural therapy" OR "existential therapy" OR "interpersonal therapy" OR "relaxation therapy" OR "narrative therapy" OR "family therapy" OR "relationship therapy" OR "relational therapy" OR "emotion focused" OR "emotionally focused" OR "rational emotive" OR logotherapy OR "network therapy" OR "support group" OR "support groups" OR "reality therapy" OR "primal therapy" OR "persuasion therapy" OR "transactional analysis" OR "insight therapy" OR "gestalt therapy" OR "feminist therapy" OR "client centered therapy" OR sociotherap* OR milieu OR bibliotherapy OR (("art therapy" OR "arts therapy") AND creative) OR "music therapy" OR "music listening" OR "autogenic training" OR "autogenic therapy" OR "autogenic relaxation" OR ("eye movement" AND (desensitization OR reprocessing)) OR biofeedback OR "guided imagery" OR hypno* OR "stress management" OR counsel* OR meditat* OR "dream analysis" OR "morita therapy" OR cotherapy OR mirroring OR storytelling OR ((reframing OR paradoxical) AND technique) OR "empty chair" OR "role playing" OR improvisation OR "active listening" OR (motivational AND (interviewing OR therapy)) OR psychoeducation* OR psychodynamic OR psychosocial OR psychodrama OR psychotherap* OR "mind body therapy" OR "mind body therapies") OR ((exercise) AND (psycholog* OR mental OR mood OR depress* OR anxiet*))) AND TITLE-ABS-KEY((cytokine* OR chemokine* OR interleukin* OR interferon* OR "tumor necrosis factor" OR "tumor necrosis factors") OR (toll AND receptor*) OR (NFkB OR ((NF OR "nuclear factor") AND ("kappa B" OR kb))) OR (leukocyte* OR neutrophil* OR "LE cell" OR "LE cells" OR monocyte* OR lymphocyte* OR "natural killer cell" OR "natural killer cells" OR "NK cell" OR "NK cells") OR ("C reactive protein") OR (cortisol)) AND TITLE-ABS-KEY((clinical AND trial) OR random*)) AND NOT INDEX(medline)

PsycInfo Search Strategy (515 articles):

((TI,AB,IF(("cognitive therapy" OR "behavioral therapy" OR "behavioural therapy" OR "existential therapy" OR "interpersonal therapy" OR "relaxation therapy" OR "narrative therapy" OR "family therapy" OR "relationship therapy" OR "relational therapy" OR "emotion focused" OR "emotionally focused" OR "rational emotive" OR logotherapy OR "network therapy" OR "support group" OR "support groups" OR "reality therapy" OR "primal therapy" OR "persuasion therapy" OR "transactional analysis" OR "insight therapy" OR "gestalt therapy" OR "feminist therapy" OR "client centered therapy" OR sociotherap* OR milieu OR bibliotherapy OR (("art therapy" OR "arts therapy") AND creative) OR "music therapy" OR "music listening" OR "autogenic training" OR "autogenic therapy" OR "autogenic relaxation" OR ("eye movement" AND (desensitization OR reprocessing)) OR biofeedback OR "guided imagery" OR hypno* OR "stress management" OR counsel* OR meditat* OR "dream analysis" OR "morita therapy" OR cotherapy OR mirroring OR storytelling OR ((reframing OR paradoxical) AND technique) OR "empty chair" OR "role playing" OR improvisation OR "active listening" OR (motivational AND (interviewing OR therapy)) OR psychoeducation* OR psychodynamic OR psychosocial OR psychodrama OR psychotherap* OR "mind body therapy" OR "mind body therapies") OR ((exercise) AND (psycholog* OR mental OR mood OR depress* OR anxiet*))) OR SU.EXACT.EXPLODE("Cognitive Techniques" OR "Psychotherapy" OR "Creative Arts Therapy" OR "Relaxation Therapy" OR "Milieu Therapy" OR "Sociotherapy" OR "Bibliotherapy" OR "Biofeedback" OR "Counseling" OR "Meditation" OR "Mind Body Therapy")) AND (TI,AB,IF((cytokine* OR chemokine* OR interleukin* OR interferon* OR "tumor necrosis factor" OR "tumor necrosis factors") OR (toll AND receptor*) OR

(NFkB OR ((NF OR "nuclear factor") AND ("kappa B" OR kb))) OR (leukocyte* OR neutrophil* OR "LE cell" OR "LE cells" OR monocyte* OR lymphocyte* OR "natural killer cell" OR "natural killer cells" OR "NK cell" OR "NK cells") OR ("C reactive protein") OR (cortisol)) OR SU.EXACT.EXPLODE("Immunologic Factors" OR "Leucocytes")) AND (TI,AB,IF((clinical AND trial) OR random*) OR SU.exact("CLINICAL TRIALS") OR ME("Treatment Outcome/Clinical Trial")))

ClinicalTrials.gov Search Strategy (628 articles):

((("cognitive therapy" OR "behavioral therapy" OR "behavioural therapy" OR "existential therapy" OR "interpersonal therapy" OR "relaxation therapy" OR "narrative therapy" OR "family therapy" OR "relationship therapy" OR "relational therapy" OR "emotion focused" OR "emotionally focused" OR "rational emotive" OR logotherapy OR "network therapy" OR "support group" OR "support groups" OR "reality therapy" OR "primal therapy" OR "persuasion therapy" OR "transactional analysis" OR "insight therapy" OR "gestalt therapy" OR "feminist therapy" OR "client centered therapy" OR sociotherap* OR milieu OR bibliotherapy OR (("art therapy" OR "arts therapy") AND creative) OR "music therapy" OR "music listening" OR "autogenic training" OR "autogenic therapy" OR "autogenic relaxation" OR ("eye movement" AND (desensitization OR reprocessing)) OR biofeedback OR "guided imagery" OR hypno* OR "stress management" OR counsel* OR meditat* OR "dream analysis" OR "morita therapy" OR cotherapy OR mirroring OR storytelling OR ((reframing OR paradoxical) AND technique) OR "empty chair" OR "role playing" OR improvisation OR "active listening" OR (motivational AND (interviewing OR therapy)) OR psychoeducation* OR psychodynamic OR psychosocial OR psychodrama OR psychotherap* OR "mind body therapy" OR "mind body therapies") OR ((exercise) AND (psycholog* OR mental OR mood OR depress* OR anxiet*))) AND ((cytokine* OR chemokine* OR interleukin* OR interferon* OR "tumor necrosis factor" OR "tumor necrosis factors") OR (toll AND receptor*) OR (NFkB OR ((NF OR "nuclear factor") AND ("kappa B" OR kb))) OR (leukocyte* OR neutrophil* OR "LE cell" OR "LE cells" OR monocyte* OR lymphocyte* OR "natural killer cell" OR "natural killer cells" OR "NK cell" OR "NK cells") OR ("C reactive protein") OR (cortisol))

MEDLINE (PubMed) search structure

Concept	Notes	MeSH terms	Keywords
Psychosocial Interventions	This section lists out the various psychosocial interventions.	"Psychotherapy"[Mesh] "Mind-Body Therapies"[Mesh] "Counseling"[Mesh]	cognitive behavioral stress management psychodynamic existential therapy music exercise biofeedback guided imagery hypnosis psychoeducation counseling psychosocial interpersonal therapy art therapy psychotherapy meditation Relaxation therapy Narrative therapy Relationship/relational therapy Eye movement desensitization therapy Emotion focused therapy Emotionally focused therapy Rational emotive behavior therapy Logotherapy Autogenic training/therapy Network therapy Support groups Reality therapy Primal therapy Persuasion therapy Transactional analysis Insight therapy Gestalt therapy Feminist therapy Psychodrama Family therapy

			Client centered therapy Sociotherapy Mileau Therapy bibliotherapy Dream analysis Morita therapy Motivational interviewing Motivational enhancement therapy Animal assisted therapy Cotherapy Mirroring Mutual storytelling Reframing/paradoxical technique Empty chair technique Role playing Improvisation Active listening
Physical Interventions with Psychosocial Component	This sub-section combines the concept of physical exercise with a broader psychological/mental outcome.	"Exercise"[Mesh] "Psychotherapy"[Mesh] "Mind-Body Therapies"[Mesh] "Affect"[Mesh] "Depression"[Mesh] "Anxiety"[Mesh]	Exercise AND: Psycholog* Mood Depress* Anxiet* Mental
Biomarkers	This section lists all of the biomarkers.	"Cytokines"[Mesh] "Leukocytes"[Mesh] "NF-kappa B"[Mesh] "Toll-Like Receptors"[Mesh] "C-Reactive Protein"[Mesh]	cytokine interleukin interferon "tumor necrosis factor" chemokine "toll-like receptor" NF-kB neutrophil monocyte lymphocyte "natural killer cell" "NK cell" "polymorphonuclear leukocytes"[tw]

			"LE cell"[tw] OR "LE cells"[tw] cortisol
RCT limit	This section limits the search to randomized controlled trials.	clinical trials as topic[MeSH Terms] clinical trial[Publication Type] random allocation[MeSH Terms] therapeutic use[MeSH Subheading])	Clinical trial Random*
Human limit	This section limits the search to human studies.	NOT (animals[Mesh] NOT humans[Mesh])	

eTable 1. Summary of Studies Included in the Meta-analysis

Reference	Intervention type	Intervention format	Intervention length (weeks)	Type of immune marker	Months from treatment cessation to immune marker assessment	Participants' mean age	Sex (% male participants)	Disease state/reason for treatment
Andersen et al. (2010) (35)	Multiple	Group	56	Cell counts, Other outcome	0	53.7	0.0	Cancer
Antoni et al. (2005) (36)	CBT	Group	10	Cell counts	0, 9	36.8	100.0	HIV
Antoni et al. (1991) (37)	CBT	Group	7	Cell counts	0	30.4	100.0	HIV
Antoni et al. (2009) (38)	CBT	Group	10	PIM, AIM	6, 12	49.7	0.0	Cancer
Antoni et al. (2000) (39)	CBT	Group	10	Cell counts	0, 9	36.0	100.0	HIV
Berger et al. (2008) (40)	CBT	Group	1, 6, 12	Cell counts, Viral load	0	44.0	14.4	HIV
Carrico et al. (2005) (41)	CBT	Group	10	Antibodies	0, 9	34.9	100.0	HIV
Castés et al. (1999) (42)	Multiple	Group	28	Antibodies, Cell counts	0	11.5	38.9	Autoimmune
Chen et al. (2011) (43)	CBT	Group	6	PIM, Other outcome	0	58.0	41.7	Other physical
Chen et al. (2008) (44)	CBT	Group	4	PIM	0	49.2	57.7	Other physical
Claesson et al. (2006) (45)	CBT	Group	10	PIM	8	60.8	0.0	Other physical
Coates et al. (1989) (46)	Other	Group	8	Antibodies, Cell counts, NK cell	0	34.9	100.0	HIV
Cohen et al. (2011) (47)	Other	No Group	2	PIM, AIM, Cell counts, NK cell	0	60.5	100.0	Cancer
Cruess et al. (2000) (48)	CBT	Group	10	Antibodies	0	36.7	100.0	HIV

Doering et al. (2007) (49)	CBT	Group	8	PIM, NK cell, Other outcome	3, 6	59.8	0.0	Other physical
Dolsen et al. (2017) (50)	CBT	No Group	8	PIM	0	36.4	45.5	Insomnia
Euteneuer et al. (2017) (51)	CBT+	No Group	8, 16	PIM, AIM, Cell counts	0	37.5	50.0	Depression
Garand et al. (2002) (52)	Psychoed	No Group	28	NK cell, Cell counts	0	65.5	8.0	Caregiving
Gonzalez-Garcia et al. (2013) (53)	Cognitive	Group	8	Cell counts	0, 3	49.4	51.3	HIV
Goodkin et al. (1998) (54)	B/S	Group	10	Cell counts	0, 6	38.3	100.0	HIV
Grossarth-Maticek & Eysenck (1989) (55)	Multiple	No Group	10	Cell counts	0	--	0.0	Cancer
Hasson et al. (2005) (56)	CBT+	No Group	28	PIM	0	--	61.7	Stress (other)
Hosaka et al. (2012) (57)	Multiple	Group	5	NK cell	0	34.8	0.0	Stress (other)
Irwin et al. (2014) (58)	CBT	Group	18	PIM	0, 12	65.1	24.0	Insomnia
Irwin et al. (2015) (59)	CBT	No Group	16, 8	PIM	0, 3, 12	64.4	24.0	Insomnia
Janelins et al. (2011) (60)	B/S	Group	12	PIM	0	53.5	0.0	Cancer
Kang & Yoo (2007) (61)	B/S	Group	10	Cell counts	0	49.5	0.0	Stress (other)
Kéri et al. (2014) (62)	CBT	No Group	16	PIM, Other outcome	0	22.6	61.3	Depression
Koh & Lee (2004) (63)	CBT+	No Group	7	PIM, Cell counts	0	34.9	54.8	Other psychiatric
Larson et al. (2000) (64)	Multiple	No Group	1.5	PIM, NK cell	0	56.0	0.0	Cancer
Laudenslager et al. (2015) (65)	CBT+	No Group	4, 10	NK cell	0	53.5	23.6	Caregiving
Lopez et al. (2013) (66)	CBT	Group	10	Cell counts, NK cell, Viral	0	31.3	0.0	HIV

Lumley et al. (2014) (67)	CBT	No Group	8	PIM	1, 4, 12	55.1	18.9	Autoimmune
Mackay et al. (2009) (68)	Other	No Group	6, 12, 18	PIM, Other outcome	0	38.3	31.7	Depression
McCain et al. (2008) (69)	CBT	Group	10	PIM, Cell counts	0, 6	42.2	60.3	HIV
McCain et al. (1996) (70)	Other	Group	6	Cell counts	6	--	100.0	HIV
McGregor et al. (2004) (71)	CBT	Group	10	Cell counts	3	47.5	0.0	Cancer
Memon et al. (2017) (72)	CBT	Group	8	PIM	0	41.5	12.7	Other psychiatric
Mikocka-Walus et al. (2016) (73)	CBT	No Group	10	PIM, Cell counts	24	49.0	49.1	Autoimmune
Mohr & Genain (2004) (74)	CBT	Group	16	AIM, Cell counts	0	47.4	29.0	Autoimmune
Mohr et al. (2001) (75)	CBT	Group	16	PIM	0	47.4	29.0	Autoimmune
Moore et al. (2013) (76)	Behavior	No Group	6	PIM	0, 12	71.1	26.0	Caregiving
Morath et al. (2014) (77)	Other	No Group	12	Cell counts	4	28.0	58.8	Other psychiatric
Parsons et al. (2007) (78)	CBT+	Group	12	Cell counts, Viral	0, 3	43.6	79.0	HIV
Savard et al. (2006) (79)	CBT	No Group	8	PIM, Cell counts, NK cell	0	51.5	0.0	Physical & Mental
Savard et al. (2005) (80)	CBT	No Group	8	PIM, Cell counts, NK cell	0	54.1	0.0	Physical & Mental
Shadick et al. (2013) (81)	Other	Group	42	PIM	0, 12	58.2	10.1	Autoimmune
Sharpe & Schrieber (2012) (82)	Behavior, Cognitive, CBT	No Group	8	PIM	0, 6	56.2	22.0	Autoimmune
Sharpe et al. (2001) (83)	CBT	No Group	8	PIM	0, 6	55.5	28.9	Autoimmune

Shen et al. (2018) (84)	Multiple	No Group	1.5	PIM	0	57.6	50.0	Other physical
Simoni et al. (2013) (85)	CBT	No Group	28	Cell counts, Viral	0, 3	46.0	72.5	Physical & Mental
Taylor et al. (2009) (86)	CBT	No Group	16	PIM	0	62.3	33.0	Depression
Theeke et al. (2016) (87)	CBT	Group	5	PIM	3	75.0	11.1	Other physical
Thornton et al. (2009) (88)	Multiple	Group	52	Cell counts	0	50.0	0.0	Depression
Zautra et al. (2008) (89)	CBT	Group	8	PIM	0	52.7	31.9	Physical & Mental
Zgierska et al. (2016) (90)	CBT+	Group	8	PIM	0, 4.5	51.8	20.0	Other physical

Note. Behavior, Behavior Therapy; CBT, Cognitive Behavior Therapy; CBT+, Cognitive Behavior Therapy + Additive; B/S, bereavement/supportive therapy; Multiple, multiple/combined interventions; Other, other psychotherapy; Psychoed, psychoeducation; Group, Includes Groups; No group, Does not include groups; PIM, Pro-inflammatory cytokines/markers; AIM, Anti-inflammatory cytokines/markers; NK cell, Natural killer cell activity; Viral, Viral load; Other outcome, Other immune outcome; Autoimmune, Autoimmune disorder, Other physical, Other physical health condition; Caregiving, Stress (caregiving); Other psychiatric, Other psychiatric disorder; Physical & Mental, Physical and mental health issue; --, study did not report the value.

eTable 2. Risk of Bias Assessment and Explanation

Andersen et al. (2010)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Low risk.	Quote: "Complete descriptions of accrual, sample characteristics, stratification and randomization, power estimates, assessment, intervention, and follow-up procedures have been published." Comment: Publication referenced used White and Freedman's minimization method for randomization. Probably done.
Allocation concealment (selection bias)	Unclear risk.	Comment: Not mentioned in the article.
Blinding of participants and personnel (performance bias)	High risk.	Comment: The allocated intervention is unable to be blinded in this study.
Blinding of outcome assessment (detection bias)	Unclear risk.	Comment: Not mentioned in the article.
Incomplete outcome data addressed (attrition bias)	Unclear risk.	Comment: Not mentioned in the article, but looking at the participant flow chart, it looks like participants in the assessment only group had higher rates of dropout and recurrence (10 vs 5; 33 vs 29)
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Comment: Insufficient information.

Antoni et al. (2005)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Unclear risk.	Quote: "We randomized men on a 2:1 CBSM/control condition ratio" Comment: Randomization method not mentioned.
Allocation concealment (selection bias)	Unclear risk.	Comment: Not mentioned in the article.
Blinding of participants and personnel (performance bias)	High risk.	Comment: The allocated intervention is unable to be blinded in this study.
Blinding of outcome assessment (detection bias)	Unclear risk.	Comment: Not mentioned in the article.
Incomplete outcome data addressed (attrition bias)	Low risk.	Quote: "There were no differences in the proportion of men from each condition who agreed to participate in the follow-up (CBSM: 16/34; control: 9/13), nor were there group differences in the reasons for nonparticipation."

		Comment: Missing outcome data balanced in numbers across intervention groups, with similar reasons for missing data across groups. Low risk for attrition bias.
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Quote: "While we detected no systematic differences between those who did and did not provide follow-up immune data, there still exists the possibility of a systematic bias. This brings into question the reliability and external validity of the findings." Comment: Unclear if this influenced results.

Antoni et al. (1991)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Unclear risk.	Quote: "The details of this [randomization] protocol are described in a treatment manual developed in our laboratory." Comment: Unpublished manuscript. Unable to find this protocol online
Allocation concealment (selection bias)	Unclear risk.	Comment: Not mentioned in the article.
Blinding of participants and personnel (performance bias)	High risk.	Comment: The allocated intervention is unable to be blinded in this study.
Blinding of outcome assessment (detection bias)	Unclear risk.	Comment: Not mentioned in the article.
Incomplete outcome data addressed (attrition bias)	Unclear risk.	Comment: Not mentioned in the article.
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Comment: Insufficient information.

Antoni et al. (2009)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Unclear risk.	Quote: "were randomly assigned to intervention or control condition on a 1:1 basis" Comment: Randomization method not mentioned.
Allocation concealment (selection bias)	Unclear risk.	Comment: Not mentioned in the article.
Blinding of participants and personnel (performance bias)	High risk.	Comment: The allocated intervention is unable to be blinded in this study.

Blinding of outcome assessment (detection bias)	Unclear risk.	Comment: Not mentioned in the article.
Incomplete outcome data addressed (attrition bias)	Low risk.	Quote: "Attrition did not differ significantly by condition at Time 2...Those stopping between Times 2 and 3 did not differ from completers on any psychosocial or physiological outcome variable or on any medical or demographic variable" Comment: Low risk of attrition bias
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Quote: "Finally the use of repeated measure ANCOVA models in the present study eliminated all subjects who had missing data for the outcome studies under investigation. This resulted in analyses based on different sample sizes, and reflect "completer" analyses rather than intent to treat analyses. These factors could have biased our results." Comment: Unclear if this bias influenced results

Antoni et al. (2000)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Unclear risk.	Quote: "This study used a randomized clinical trial comparing HTV+ men assigned to a CBSM condition with men assigned to a wait-list control in order to establish the efficacy of CBSM" Comment: Randomization method not mentioned.
Allocation concealment (selection bias)	Unclear risk.	Comment: Not mentioned in the article.
Blinding of participants and personnel (performance bias)	High risk.	Comment: The allocated intervention is unable to be blinded in this study.
Blinding of outcome assessment (detection bias)	Unclear risk.	Comment: Not mentioned in the article.
Incomplete outcome data addressed (attrition bias)	Unclear risk.	Comment: Not mentioned in the article.
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Comment: Insufficient information.

Berger et al. (2008)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Low risk	Quote: "Participants were stratified according to CD4 lymphocyte nadir (0–50, 51–200, > 200 cells/ml) ... Allocation sequences included randomly permuted block sizes of two and four and were generated using the computer program RANCODE V3.0"

		Comment: Probably done.
Allocation concealment (selection bias)	Low risk.	Quote: "Individual assignment codes were properly concealed between black sheets, stored in sequentially numbered envelopes and opened in the presence of study participants." Comment: Probably done.
Blinding of participants and personnel (performance bias)	High risk.	Comment: The allocated intervention is unable to be blinded in this study.
Blinding of outcome assessment (detection bias)	Unclear risk.	Comment: Not mentioned in the article.
Incomplete outcome data addressed (attrition bias)	Unclear risk.	Comment: Not mentioned in the article. But more participants in the intervention group declined psychosocial baseline assessment and intervention (18 vs 9)
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Comment: Insufficient information.

Carrico et al. (2005)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Unclear risk.	Quote: "We randomized participants to the CBSM and control conditions at a 2:1 ratio to facilitate within group analyses of CBSM effects on psychological and immunologic variables" Comment: Specific randomization procedure not mentioned.
Allocation concealment (selection bias)	Unclear risk.	Comment: Not mentioned in the article.
Blinding of participants and personnel (performance bias)	High risk.	Comment: The allocated intervention is unable to be blinded in this study.
Blinding of outcome assessment (detection bias)	Unclear risk.	Comment: Not mentioned in the article.
Incomplete outcome data addressed (attrition bias)	Low risk.	Quote: "Results indicated that completers did not differ significantly from noncompleters on any health-related or demographic variable examined" Comment: Missing outcome data balanced in numbers across groups, with similar reasons for missing data across groups.
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Quote: "Although we determined that there were no evident, systematic biases related to whether participants provided follow-up data, the possibility remains that some unexamined variable differentially influenced follow-up"

		Comment: Unclear if this bias influenced results.
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Castés et al. (1999)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Unclear risk.	Quote: "To establish the PSI and control groups, we selected asthmatic children from two different sectors of the largest village (San Pedro) on the island... The 36 children selected represented the total of the asthmatics available in each sector who met the above criteria, 20 coming from one sector and 16 from the other. The physical separation between the two groups was designed to minimize the day-to-day contact between these groups, thus avoiding contamination of the protocol." Comment: Randomized based on location.
Allocation concealment (selection bias)	Unclear risk.	Comment: Not mentioned in the article.
Blinding of participants and personnel (performance bias)	High risk.	Comment: The allocated intervention is unable to be blinded in this study.
Blinding of outcome assessment (detection bias)	Unclear risk.	Comment: Not mentioned in the article.
Incomplete outcome data addressed (attrition bias)	Low risk.	Comment: Minimal missing data. 1 participant withdrew because "she did not recognize herself as asthmatic"
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Comment: Insufficient information.

Chen et al. (2011)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Low risk.	Quote: "We randomized participants by computer-generated random numbers with an allocation ratio of 1:1" Comment: Probably done.
Allocation concealment (selection bias)	Low risk.	Quote: "Participants were informed of their allocation sequence by the nursing staff, and the sequence was concealed until the interventions were assigned." Comment: Probably done.
Blinding of participants and personnel (performance bias)	High risk.	Comment: The allocated intervention is unable to be blinded in this study.
Blinding of outcome assessment (detection bias)	Unclear risk.	Comment: Not mentioned in the article.

Incomplete outcome data addressed (attrition bias)	Low risk.	Comment: Similar number of participants refused to participate after randomization and withdrew informed consents (3 in CBT group, 5 in control group). No other missing data.
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Comment: Insufficient information.

Chen et al. (2008)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Low risk.	Quote: "We randomly assigned participants by using computer-generated randomized numbers with an allocation ratio of 1:1" Comment: Probably done.
Allocation concealment (selection bias)	Low risk.	Quote: "The sequence was concealed until the interventions were assigned." Comment: Probably done.
Blinding of participants and personnel (performance bias)	High risk.	Quote: "This pilot study did not use a double-blind design, and participants were informed of their allocation sequence by telephone." Comment: The allocated intervention is unable to be blinded in this study.
Blinding of outcome assessment (detection bias)	Unclear risk.	Comment: Not mentioned in the article.
Incomplete outcome data addressed (attrition bias)	Low risk.	Comment: 2 participants in control group did not receive control treatment due to lack of cooperation. No other missing data.
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Comment: Insufficient information.

Claesson et al. (2006)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Unclear risk.	Quote: "Women with IHD were randomized to either a 1-year cognitive-behavioural stress management programme or usual care." Comment: Specific randomization procedure not mentioned.
Allocation concealment (selection bias)	Low risk.	Quote: "Randomization was by sealed envelopes, stratified by place of living into three geographical areas." Comment: Probably done.
Blinding of participants and personnel (performance bias)	High risk.	Comment: The allocated intervention is unable to be blinded in this study.

Blinding of outcome assessment (detection bias)	Unclear risk.	Comment: Not mentioned in the article.
Incomplete outcome data addressed (attrition bias)	Unclear risk.	Comment: Not mentioned in the article. But more participants lost to follow up in intervention group (21 vs 10). Similar number between groups excluded due to steroid use (3 vs 5).
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Low risk.	<p>Quote: "The risk of having negative results due to bias working in the direction of equivalence must be considered. Some influence could not be totally excluded, but is probably limited, as the trend in both groups, with some deterioration from baseline to follow up, is similar."</p> <p>Quote: "There was a longer interval between the baseline and follow up samplings in the intervention than in the control group. We do not think this had any significant influence on the results, since the delay was before entering the programme, and the early stage of mental and biological adjustments most likely had passed in all subjects, considering the minimum 4-month interval before enrolment."</p> <p>Comment: Risk is likely low.</p>

Coates et al. (1989)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Unclear risk.	<p>Quote: "Subjects were then randomized into treatment or control groups."</p> <p>Comment: Specific randomization procedure not mentioned.</p>
Allocation concealment (selection bias)	Unclear risk.	Comment: Not mentioned in the article.
Blinding of participants and personnel (performance bias)	High risk.	Comment: The allocated intervention is unable to be blinded in this study. Laboratory staff were blinded to participant assignment.
Blinding of outcome assessment (detection bias)	Unclear risk.	Comment: Not mentioned in the article.
Incomplete outcome data addressed (attrition bias)	Unclear risk.	Comment: Not mentioned in the article.
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Comment: Insufficient information.

Cohen et al. (2011)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Low risk.	Quote: "patients were randomly assigned to one of three groups—SM, SA, or SC—using an adaptive randomization procedure called minimization"

		Comment: Probably done.
Allocation concealment (selection bias)	Unclear risk.	Comment: Not mentioned in the article.
Blinding of participants and personnel (performance bias)	High risk.	Comment: The allocated intervention is unable to be blinded in this study
Blinding of outcome assessment (detection bias)	Low risk.	Comment: A dedicated research assistant, who was blinded to group assignment, collected all measures.
Incomplete outcome data addressed (attrition bias)	Unclear risk.	Comment: Not mentioned in the article. In each group, less data was available over time, but reasons for participant dropout were not mentioned nor was the way researchers handled missing data.
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Comment: Participants were primarily white, non-Hispanic, married, and highly educated. Possibly biased sample.

Cruess et al. (2000)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Unclear risk.	Quote: "participants were randomly assigned to either the experimental (10-week CBSM intervention) or control condition." Comment: Specific randomization procedure not mentioned.
Allocation concealment (selection bias)	Unclear risk.	Comment: Not mentioned in the article.
Blinding of participants and personnel (performance bias)	High risk.	Comment: The allocated intervention is unable to be blinded in this study.
Blinding of outcome assessment (detection bias)	Unclear risk.	Comment: Not mentioned in the article.
Incomplete outcome data addressed (attrition bias)	Low risk.	Quote: "analyses revealed no significant differences between groups in baseline HIV medication status, CDC HIV disease stage, ethnicity, living arrangements, employment status, or education" Comment: Low risk of attrition bias
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Comment: Not mentioned in the article.

Doering et al. (2007)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Unclear risk.	Quote: "patient was randomized to receive either UC-CBT or UC alone"

		Comment: Specific randomization procedure not mentioned.
Allocation concealment (selection bias)	Unclear risk.	Comment: Not mentioned in the article.
Blinding of participants and personnel (performance bias)	High risk.	Comment: The allocated intervention is unable to be blinded in this study
Blinding of outcome assessment (detection bias)	Low risk.	Quote: "All patients received monthly telephone calls from a research assistant who was blinded to depression status and group assignment and who administered the MHR to assess for the presence of illness episodes." Comment: Probably done.
Incomplete outcome data addressed (attrition bias)	Low risk.	Quote: "Only those patients who completed all study measures (n=52) were included in this report. There were no demographic or clinical differences between patients who completed the study and those who dropped out" Comment: Low risk of attrition bias.
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Comment: Insufficient information.

Dolsen et al. (2017)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Unclear risk.	Quote: "Participants were randomly allocated to CBTI-BP (n = 11) or Psychoeducation (PE; n = 11)" Comment: Specific randomization procedure not mentioned.
Allocation concealment (selection bias)	Unclear risk.	Comment: Not mentioned in the article.
Blinding of participants and personnel (performance bias)	High risk.	Comment: The allocated intervention is unable to be blinded in this study
Blinding of outcome assessment (detection bias)	Unclear risk.	Comment: Not mentioned in the article.
Incomplete outcome data addressed (attrition bias)	Low risk.	Quote: "Attrition rates were not significantly different between treatment groups in the present sample" Comment: Low risk of attrition bias
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Quote: "due to recommendations for small sample sizes and risk of overfitting statistical models, we did not control for variables known to influence pro-inflammatory cytokines such as age, sex, socioeconomic status, race and ethnicity, or body mass index. In a fully powered study, it may be informative to evaluate the influence of these factors. Fourth,

		<p>95.5% of participants were prescribed mood stabilizers. Although this may bias the results, we suggest that the present study is notable because effects were observed despite most participants taking medication known to reduce inflammation”</p> <p>Comment: Possible bias.</p>
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Euteneuer et al. (2017)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Low risk.	<p>Quote: “randomly assigned using simple computerized randomization to either CBT-E, CBT-C or WL”</p> <p>Comment: Probably done.</p>
Allocation concealment (selection bias)	Unclear risk.	Comment: Not mentioned in the article.
Blinding of participants and personnel (performance bias)	Low risk.	<p>Quote: “Patients and therapists were blinded to the purpose and study hypothesis”</p> <p>Comment: Knowledge of intervention group (CBT-E vs CBT-C) unlikely to influence results.</p>
Blinding of outcome assessment (detection bias)	Unclear risk.	Comment: Not mentioned in the article.
Incomplete outcome data addressed (attrition bias)	Low risk.	<p>Quote: “Full information maximum likelihood estimation was used to handle missing data.”</p> <p>Comment: Missing data have been imputed using appropriate methods. Low risk of attrition bias</p>
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	<p>Quote: “Although the physical activity questionnaire used in this study has good reliability and validity, response bias cannot be excluded and an additional use of objective measures would have been beneficial.”</p> <p>Comment: Possible bias.</p>

Garand et al. (2002)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Unclear risk.	<p>Quote: “Mood and immune outcomes were compared between caregivers randomly assigned to receive either the PLST or a comparison intervention.”</p> <p>Comment: Specific randomization procedure not mentioned.</p>
Allocation concealment (selection bias)	Unclear risk.	Comment: Not mentioned in the article.
Blinding of participants and personnel (performance bias)	Low risk.	Quote: “This study used a two-group randomized single-blind (subject blind to treatment group assignment) design”

		Comment: Subjects blind to treatment group assignment. Probably done.
Blinding of outcome assessment (detection bias)	Unclear risk.	Comment: Not mentioned in the article.
Incomplete outcome data addressed (attrition bias)	Low risk.	Quote: "there were no statistically significant differences on baseline demographic or outcome variables between the two subjects dropping participation and the 37 subjects completing the study." Comment: Missing outcome data balanced in numbers across intervention groups, with similar reasons for missing data across groups. Low risk of attrition bias
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Quote: "the internal validity of this study may have been jeopardized by selection bias because the random assignment of subjects to treatment condition resulted in nonequivalent groups" Comment: Possible bias.

Gonzalez-Garcia et al. (2013)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Low risk.	Quote: "Patients fulfilling the inclusion criteria were randomized 1:1 by a computer-generated list to follow the MBCT program or to continue with routine visits (control group). Randomization was stratified by gender." Comment: Probably done.
Allocation concealment (selection bias)	Unclear risk.	Comment: Not mentioned in the article.
Blinding of participants and personnel (performance bias)	High risk.	Comment: The allocated intervention is unable to be blinded in this study
Blinding of outcome assessment (detection bias)	Unclear risk.	Comment: Not mentioned in the article.
Incomplete outcome data addressed (attrition bias)	Unclear risk.	Comment: Not mentioned in the article. But according to flow chart, there was 0 missing data for control group and 5 missing data point for intervention group (reasons included: unable to attend, exitus, and declined to participate).
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Comment: Insufficient information.

Goodkin et al. (1998)

Bias	Judgment	Support for judgment
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Random sequence generation (selection bias)	Unclear risk.	Quote: "subjects were randomly assigned to either a 10-week bereavement support group intervention or a standard of care control condition." Comment: Specific randomization procedure not mentioned.
Allocation concealment (selection bias)	Unclear risk.	Comment: Not mentioned in the article.
Blinding of participants and personnel (performance bias)	High risk.	Comment: The allocated intervention is unable to be blinded in this study.
Blinding of outcome assessment (detection bias)	Low risk.	Quote: "The number of health care visits over the previous 6 months was obtained by self-report to the study physician performing physical examinations for CDC staging while blinded to each subject's assignment and serostatus." Comment: Probably done.
Incomplete outcome data addressed (attrition bias)	Unclear risk.	Comment: Not mentioned in the article.
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Comment: Insufficient information.

Grossarth-Maticek & Eysenck (1989)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Unclear risk.	Quote: "Patients were allocated to the different psychotherapies at random." Comment: Specific randomization procedure not mentioned.
Allocation concealment (selection bias)	Unclear risk.	Comment: Not mentioned in the article.
Blinding of participants and personnel (performance bias)	High risk.	Comment: The allocated intervention is unable to be blinded in this study
Blinding of outcome assessment (detection bias)	Unclear risk.	Comment: Not mentioned in the article.
Incomplete outcome data addressed (attrition bias)	Unclear risk.	Comment: Not mentioned in the article.
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Low risk.	Quote: "Since chemotherapy was not randomly assigned to subjects, it is possible that differences in the initial values of metastases detection time or psychosocial variables contribute to the pattern of results. These factors were therefore controlled by multiple regression."

		Comment: Potential bias was statistically controlled for.
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Hasson et al. (2005)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Low risk.	Quote: "The participating departments were, within each company, randomized by lottery to either the intervention or reference group." Comment: Probably done.
Allocation concealment (selection bias)	Unclear risk.	Comment: Not mentioned in the article.
Blinding of participants and personnel (performance bias)	High risk.	Comment: The allocated intervention is unable to be blinded in this study.
Blinding of outcome assessment (detection bias)	Unclear risk.	Comment: Not mentioned in the article.
Incomplete outcome data addressed (attrition bias)	Low risk.	Quote: "The reasons for dropping out were job termination (n = 7), change of workplace (n = 2), foreign service or moving abroad (n = 6) or other reasons (n = 11). There were no significant differences in dropout rates between the groups (6.9% in the intervention group vs. 9.8% in the reference group)." Comment: Low risk of attrition bias
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Quote: "we have no exact number of potential participants in the study. This fact might bias the results considering that the sample might not be representative for all the employees." Comment: Possible bias

Hosaka et al. (2012)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	High risk.	Quote: "Randomization was performed according to registration numbers, i.e., the odd numbers were assigned to the intervention group and the even numbers to the controls." Comment: Sequence generated by a rule based registration number (systematic, non-random approach).
Allocation concealment (selection bias)	Unclear risk.	Comment: Not mentioned in the article.
Blinding of participants and personnel (performance bias)	High risk.	Comment: The allocated intervention is unable to be blinded in this study.
Blinding of outcome assessment (detection bias)	Unclear risk.	Comment: Not mentioned in the article.

Incomplete outcome data addressed (attrition bias)	Unclear risk.	Comment: Minimal missing data. According to flow chart, 3 participants dropped out in both the intervention and control group.
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Comment: Insufficient information.

Irwin et al. (2014)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Low risk.	Quote: "The randomization sequence was generated via computerized random number generator prior the start of the trial in blocks of 3 conditions (CBT: TCC: SS; 2:2:1)." Comment: Probably done.
Allocation concealment (selection bias)	Low risk.	Quote: "To maintain allocation concealment, none of the research staff who assessed subjects or enrolled participants had access to the randomization list; staff were specifically told that simple randomization was being used such that any of the 3 treatments was possible for each group assignment. In addition, the individual (RO), who managed the randomization list, never interacted with any participants nor viewed any data from the participants prior to their assignment to condition." Comment: Probably done.
Blinding of participants and personnel (performance bias)	High risk.	Quote: "Participants were aware of their intervention assignment" Comment: The allocated intervention is unable to be blinded in this study.
Blinding of outcome assessment (detection bias)	Low risk.	Quote: "Outcome assessors were unaware of group assignments." Comment: Probably done. Low risk of detection bias.
Incomplete outcome data addressed (attrition bias)	Low risk.	Quote: "Other demographic and outcome variables did not differ between the completers and non-completers at months 4 or 16. At month 4, the drop-out rate tended to be higher in the TCC group as compared to CBT and SS ($\chi^2(2) = 5.77$; $P = 0.06$), but at month 16 the retention rate was similar" Quote: "data from all randomized participants were included with no imputation of missing data. The mixed model approach utilizes all available data and generates unbiased estimates under the assumption that data are missing at random (MAR); or more restrictively, missing completely at random (MCAR). Because it would require information that is, by definition, not available, there are no well-established tests of the MAR assumption; hence, the MCAR assumption was tested." Comment: Missing outcome data balanced in numbers across intervention groups, with similar reasons for missing data across groups.

Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Comment: Insufficient information.

Irwin et al. (2015)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Unclear risk.	Quote: "123 older adults with insomnia were randomly assigned to cognitive behavioral therapy for insomnia (CBT-I), tai chi chih (TCC), or sleep seminar education active control condition (SS)" Comment: Specific randomization procedure not mentioned.
Allocation concealment (selection bias)	Unclear risk.	Comment: Not mentioned in the article.
Blinding of participants and personnel (performance bias)	High risk.	Quote: " participants were aware of their intervention assignment" Comment: The allocated intervention is unable to be blinded in this study
Blinding of outcome assessment (detection bias)	Unclear risk.	Comment: Not mentioned in the article.
Incomplete outcome data addressed (attrition bias)	Low risk.	Quote: "The observed pattern of missing data did not violate the missing completely at random assumption" Comment: Missing outcome data balanced in numbers across intervention groups, with similar reasons for missing data across groups.
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Comment: Insufficient information.

Janelins et al. (2011)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Low risk.	Quote: "Randomization was achieved by the flipping of a coin" Comment: Probably done.
Allocation concealment (selection bias)	Unclear risk.	Comment: Not mentioned in the article.
Blinding of participants and personnel (performance bias)	High risk.	Comment: The allocated intervention is unable to be blinded in this study.
Blinding of outcome assessment (detection bias)	Unclear risk.	Comment: Not mentioned in the article.
Incomplete outcome data addressed (attrition bias)	Unclear risk.	Comment: Not mentioned in the article.

Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Comment: Insufficient information.

Kang & Yoo (2007)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	High risk.	Quote: "The research sample was a non-random convenient sample to which the researcher could have access for data collection." Comment: High risk of selection bias.
Allocation concealment (selection bias)	Unclear risk.	Comment: Not mentioned in the article.
Blinding of participants and personnel (performance bias)	High risk.	Comment: The allocated intervention is unable to be blinded in this study
Blinding of outcome assessment (detection bias)	Unclear risk.	Comment: Not mentioned in the article.
Incomplete outcome data addressed (attrition bias)	Unclear risk.	Comment: Not mentioned in the article. But Individual circumstances led 1 subject from the experimental group and 3 from the control group to resign. The final number of participants was 17 for the experimental group and 10 for the control group.
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Comment: Insufficient information.

Kéri et al. (2014)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Unclear risk.	Comment: Not mentioned in the article.
Allocation concealment (selection bias)	Unclear risk.	Comment: Not mentioned in the article.
Blinding of participants and personnel (performance bias)	High risk.	Comment: The allocated intervention is unable to be blinded in this study
Blinding of outcome assessment (detection bias)	Unclear risk.	Comment: Not mentioned in the article.
Incomplete outcome data addressed (attrition bias)	Unclear risk.	Comment: Not mentioned in the article.
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.

Other bias	Unclear risk.	Quote: "Because of ethical concerns, we did not include an MDD group receiving placebo treatment. Therefore, it is not clear whether the observed changes are merely associated with symptomatic improvement or these are specific for CBT" Comment: Not true randomization. Possible bias.
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Koh & Lee (2004)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Unclear risk.	Quote: "21 were randomly assigned to a combined treatment of CBT and an antianxiety agent, and 21 were assigned to an antianxiety agent only" Comment: Specific randomization procedure not mentioned.
Allocation concealment (selection bias)	Unclear risk.	Comment: Not mentioned in the article.
Blinding of participants and personnel (performance bias)	High risk.	Comment: The allocated intervention is unable to be blinded in this study.
Blinding of outcome assessment (detection bias)	Unclear risk.	Comment: Not mentioned in the article.
Incomplete outcome data addressed (attrition bias)	Unclear risk.	Comment: Not mentioned in the article.
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Comment: Insufficient information.

Larson et al. (2000)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Unclear risk.	Quote: "Volunteers were randomly assigned to either a control group (N = 18) or an experimental group (N = 23)" Comment: Specific randomization procedure not mentioned
Allocation concealment (selection bias)	Unclear risk.	Comment: Not mentioned in the article.
Blinding of participants and personnel (performance bias)	High risk.	Comment: The allocated intervention is unable to be blinded in this study
Blinding of outcome assessment (detection bias)	Unclear risk.	Comment: Not mentioned in the article.
Incomplete outcome data addressed (attrition bias)	Unclear risk.	Quote: "A number of data points were also incomplete or missing for reasons that included: patient error (e.g., questionnaires filled out incorrectly or incompletely); patient refusal to allow blood to be drawn; inability to obtain an adequate blood sample; and laboratory errors"

		Comment: Unclear if data was missing equally between groups or if any statistical method was used to account for missingness.
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Comment: Insufficient information.

Laudenslager et al. (2015)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Unclear risk.	Quote: "Consented participants ($n=148$ caregivers) were randomized with intent-to-treat by permuted block design to either PsychoEducation, Paced Respiration and Relaxation (PEPRR) or TAU" Comment: Specific randomization procedure not mentioned
Allocation concealment (selection bias)	Low risk.	Quote: "The biostatistician (SKM-G) developed the randomization allocation which was available only to the site coordinator (TLS)." Comment: Likely low risk of selection bias.
Blinding of participants and personnel (performance bias)	High risk.	Comment: The allocated intervention is unable to be blinded in this study
Blinding of outcome assessment (detection bias)	Low risk.	Quote: "Dr Laudenslager and Dr Mikulich-Gilbertson had full access to all the data in blinded format and are responsible for its integrity, reporting to the DSMB and the accuracy of data analysis." Quote: "a clear analysis plan was in place prior to breaking the blind." Comment: Probably done.
Incomplete outcome data addressed (attrition bias)	Low risk.	Quote: "Chi-square tests confirmed no differences between groups in the pattern of missing data." Comment: Missing outcome data balanced in numbers across intervention groups, with similar reasons for missing data across groups.
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Quote: "Caregivers undergo significant prescreening before approval raising a potential selection bias against disrupted physiological regulation." Comment: Potential bias.

Lopez et al. (2013)

Bias	Judgment	Support for judgment
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Random sequence generation (selection bias)	Unclear risk.	Quote: "participants were randomized to CBSM or to the control condition. A 2:1 ratio procedure was implemented." Comment: Specific randomization procedure not specified.
Allocation concealment (selection bias)	Unclear risk.	Comment: Not mentioned in the article.
Blinding of participants and personnel (performance bias)	High risk.	Comment: The allocated intervention is unable to be blinded in this study
Blinding of outcome assessment (detection bias)	Unclear risk.	Comment: Not mentioned in the article.
Incomplete outcome data addressed (attrition bias)	Low risk.	Quote: "Missing follow-up data was imputed in the present study by utilizing a linear interpolation method" Comment: Missing data have been imputed using appropriate methods.
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Quote: "As with all studies utilizing small samples with missing data, interpretation of results should be made with caution due to limitations in power and biases introduced by missing data estimation techniques." Comment: Potential bias.

Lumley et al. (2014)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Low risk.	Quote: "a person independent of the study staff used randomization software to develop the condition assignments. To balance the conditions by important variables, randomization was stratified by the two study sites as well as three current medication classes" Comment: Probably done.
Allocation concealment (selection bias)	Low risk.	Quote: "the research assistant and each patient jointly opened the next envelope in the sequence, which contained the patient's randomly assigned writing and training conditions" Comment: Probably done.
Blinding of participants and personnel (performance bias)	High risk.	Comment: The allocated intervention is unable to be blinded in this study
Blinding of outcome assessment (detection bias)	Unclear risk.	Quote: "Quote: "Patients were assessed at baseline and three follow-up assessments over 12 months on a range of outcomes, including self-report measures, blinded physical examination and walking speed test, and an inflammatory marker."

		<p>Quote: "A rheumatologist, kept blind to patients' treatment conditions, conducted a physical examination and joint assessment."</p> <p>Comment: Probably done.</p>
Incomplete outcome data addressed (attrition bias)	High risk.	<p>Quote: "This is done by default in HLM, which estimates missing outcome values; but for the ANCOVAs, we replaced those few missing outcome values with the last available value, which in most cases was the baseline value"</p> <p>Quote: " those who dropped were more likely to be male ($p=.04$), non-White ($p=.055$), and had greater psychological symptoms ($p=.04$) than those who completed."</p> <p>Comment: Imbalance in participant demographics for missing data across groups.</p>
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	<p>Quote: "As with all studies utilizing small samples with missing data, interpretation of results should be made with caution due to limitations in power and biases introduced by missing data estimation techniques."</p> <p>Comment: Potential bias.</p>

Mackay et al. (2009)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Unclear risk.	<p>Quote: "randomised allocation of patients to the drug treatment groups"</p> <p>Comment: Specific randomization procedure not specified.</p>
Allocation concealment (selection bias)	Unclear risk.	Comment: Not mentioned in the article.
Blinding of participants and personnel (performance bias)	High risk.	Comment: The allocated intervention is unable to be blinded in this study
Blinding of outcome assessment (detection bias)	Unclear risk.	Comment: Not mentioned in the article.
Incomplete outcome data addressed (attrition bias)	Unclear risk.	Comment: Not mentioned in the article.
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Comment: Insufficient information.

McCain et al. (2008)

Bias	Judgment	Support for judgment
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Random sequence generation (selection bias)	Low risk.	Quote: "Within each stratum, participants were randomly assigned following baseline data collection to an immediate intervention or the wait-list group by means of a computer-generated, blocked pattern administered from a blinded list by a project coordinator." Comment: Probably done.
Allocation concealment (selection bias)	Unclear risk.	Comment: Not mentioned in the article.
Blinding of participants and personnel (performance bias)	High risk.	Comment: The allocated intervention is unable to be blinded in this study.
Blinding of outcome assessment (detection bias)	Low risk.	Quote: "All laboratory and data entry personnel were blinded to participants' group assignments." Comment: Probably done.
Incomplete outcome data addressed (attrition bias)	Low risk.	Quote: "There was no differential loss among the groups. Using an intent-to-treat analysis, we included in the analyses all participants who had any outcome data. No data were imputed for analyses." Comment: Missing outcome data balanced in numbers across intervention groups, with similar reasons for missing data across groups.
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Comment: Insufficient information.

McCain et al. (1996)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	High risk.	Quote: "A pretest-posttest, two-arm nonrandomized design was used to compare the effectiveness of the stress management intervention with standard outpatient clinic care." Comment: Non-random study design.
Allocation concealment (selection bias)	Unclear risk.	Comment: Not mentioned in the article.
Blinding of participants and personnel (performance bias)	High risk.	Comment: The allocated intervention is unable to be blinded in this study.
Blinding of outcome assessment (detection bias)	Unclear risk.	Comment: Not mentioned in the article.
Incomplete outcome data addressed (attrition bias)	Low risk.	Quote: "No discernible characteristics distinguished those who did and did not complete the study."

		Comment: Missing outcome data balanced in numbers across intervention groups, with similar reasons for missing data across groups.
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Quote: "The intervention group had significantly lower preintervention levels of negative impact stress as measured by the DIS than did the remainder of the sample. This may reflect a type of self-selection bias, creating a potential floor effect for this measure of stress." Comment: Potential bias.

McGregor et al. (2004)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Unclear risk.	Quote: "Twenty-nine women were randomly assigned to receive either a 10-week CBSM intervention ($n=18$) or a comparison experience ($n=11$)." Comment: Specific randomization procedure not specified.
Allocation concealment (selection bias)	Unclear risk.	Comment: Not mentioned in the article.
Blinding of participants and personnel (performance bias)	High risk.	Comment: The allocated intervention is unable to be blinded in this study.
Blinding of outcome assessment (detection bias)	Unclear risk.	Comment: Not mentioned in the article.
Incomplete outcome data addressed (attrition bias)	Low risk.	Quote: "The drop out rate did not differ across the conditions." Comment: Missing outcome data balanced in numbers across intervention groups.
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Comment: Insufficient information.

Memon et al. (2017)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Unclear risk.	Quote: "The randomization protocol was designed by the Competence Center for Clinical Research at Lund University." Comment: Specific randomization procedure not specified.

Allocation concealment (selection bias)	Unclear risk.	Comment: Not mentioned in the article.
Blinding of participants and personnel (performance bias)	High risk.	Comment: It is unclear whether the participants knew enough about either intervention to understand their group placement.
Blinding of outcome assessment (detection bias)	Unclear risk.	Comment: Not mentioned in the article.
Incomplete outcome data addressed (attrition bias)	Unclear risk.	<p>Quote: "During the treatment, 10 and 20 participants either dropped out or had missing data in the CBT and mindfulness respectively. The main reasons for drop-out were work situation and lack of time. Other reasons included moving, sickness, no desire for treatment and disappointment at being randomized to the CBT group."</p> <p>Comment: Not mentioned in the article if missingness was statistically accounted for or if the differences in reason for dropout was significantly different across groups.</p>
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Comment: Insufficient information.

Mikocka-Walus et al. (2016)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Low risk.	<p>Quote: "We conducted a randomised controlled trial and the detailed methods as well as the data for the first 12 months of observation have been reported elsewhere"</p> <p>Comment: Article cited reports that "A simple randomisation method was used using a table of computer generated random numbers (in blocks of four) in the proportion of 2:1 (experimental vs. control)."</p>
Allocation concealment (selection bias)	Unclear risk.	Comment: Not mentioned in the article.
Blinding of participants and personnel (performance bias)	High risk.	Comment: The allocated intervention is unable to be blinded in this study.
Blinding of outcome assessment (detection bias)	Unclear risk.	Comment: Not mentioned in the article.
Incomplete outcome data addressed (attrition bias)	High risk.	<p>Quote: "There was significant attrition observed in both groups, with +CBT group participants dropping from the trial in greater numbers (67 % in +CBT vs. 46 % in SC, $p = 0.007$). The majority of the participants who dropped out of the study were either not contactable."</p> <p>Quote: "The multivariate analyses were conducted using linear mixed-effects models which allowed for the retention of all subjects in the model including those with missing data."</p>

		Comment: Imbalanced attrition rates across groups. Likely not statistically accounted for.
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Comment: Insufficient information.

Mohr & Genain (2004)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Unclear risk.	Quote: "Patients were randomly assigned to one of three commonly used 16-week treatments for depression." Comment: Specific randomization procedure not specified.
Allocation concealment (selection bias)	Unclear risk.	Comment: Not mentioned in the article.
Blinding of participants and personnel (performance bias)	High risk.	Comment: The allocated intervention is unable to be blinded in this study.
Blinding of outcome assessment (detection bias)	Unclear risk.	Comment: Not mentioned in the article.
Incomplete outcome data addressed (attrition bias)	Unclear risk.	Comment: Not mentioned in the article.
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Comment: Insufficient information.

Mohr et al. (2001)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Unclear risk.	Quote: "Patients were randomly assigned to 1 of 3 commonly used 16-week treatments for depression" Comment: Specific randomization procedure not specified.
Allocation concealment (selection bias)	Unclear risk.	Comment: Not mentioned in the article.
Blinding of participants and personnel (performance bias)	High risk.	Comment: The allocated intervention is unable to be blinded in this study.
Blinding of outcome assessment (detection bias)	Unclear risk.	Comment: Not mentioned in the article.
Incomplete outcome data addressed (attrition bias)	Unclear risk.	Comment: Not mentioned in the article.
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.

Other bias	Unclear risk.	Comment: Insufficient information.
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Moore et al. (2013)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Low risk.	Quote: "A computerized random number generator was used to randomize caregivers to either the PEP or IS condition." Comment: Probably done.
Allocation concealment (selection bias)	Unclear risk.	Comment: Not mentioned in the article.
Blinding of participants and personnel (performance bias)	High risk.	Comment: The allocated intervention is unable to be blinded in this study.
Blinding of outcome assessment (detection bias)	Unclear risk.	Quote: "Throughout the trial assessors and the research nurse were blind to randomization condition." Comment: Probably done.
Incomplete outcome data addressed (attrition bias)	Low risk.	Quote: "no baseline characteristics were associated with dropout over the course of the trial" Comment: Missing outcome data balanced in numbers across intervention groups, with similar reasons for missing data across groups.
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Comment: Insufficient information.

Morath et al. (2014)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Unclear risk.	Quote: "After the initial screening, individuals with PTSD (age 16-47 years) e refugees (13 Africa, 21 Middle East) with a history of war and torture experiences e were randomly assigned to either a treatment (NET group: n 17) or a waitlist control condition (WLC group: n 17)." Comment: Specific randomization procedure not specified.
Allocation concealment (selection bias)	Unclear risk.	Comment: Not mentioned in the article.
Blinding of participants and personnel (performance bias)	High risk.	Comment: The allocated intervention is unable to be blinded in this study.
Blinding of outcome assessment (detection bias)	Unclear risk.	Comment: Not mentioned in the article.
Incomplete outcome data addressed (attrition bias)	Low risk.	Comment: Not mentioned in the article. But looking at the participant flow chart, reasons for missing data were similar across the two groups.

Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Comment: Insufficient information.

Parsons et al. (2007)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Low risk.	Quote: "Eligible participants were assigned to the 8-session intervention or to an 8-session educational comparison condition, using urn randomization procedures, which are systematically biased in favor of balancing groups. This procedure preserves randomization as the primary basis for assignment to condition, is less susceptible to experimenter bias or manipulation of the assignment process by staff, allows matching on several variables (in this study, viral load and AUDIT score), and most efficiently ensures multivariate equivalence of treatment group" Comment: Probably done.
Allocation concealment (selection bias)	Unclear risk.	Comment: Not mentioned in the article.
Blinding of participants and personnel (performance bias)	High risk.	Comment: The allocated intervention is unable to be blinded in this study.
Blinding of outcome assessment (detection bias)	Unclear risk.	Comment: Not mentioned in the article.
Incomplete outcome data addressed (attrition bias)	Low risk.	Quote: "The attrition rate was the same (10%) for the 6-month follow-up, and there was no significant difference in attrition between the 2 conditions at 3 or 6 months" Comment: Missing outcome data balanced in numbers across intervention groups, with similar reasons for missing data across groups;
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Quote: "It is also possible that improvements over time in both conditions reflect a reporting bias, whereas changes in viral load and CD4 cell count reflect true changes in adherence behavior as a result of the intervention." Comment: Possible bias.

Savard et al. (2006)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Low risk.	Quote: "using a computer-generated random numbers table" Comment: Probably done.
Allocation concealment (selection bias)	Low risk.	Quote: "The group allocation was contained in individually sealed envelopes, prepared by the principal investigator prior to study initiation"

		Comment: Probably done.
Blinding of participants and personnel (performance bias)	High risk.	Comment: The allocated intervention is unable to be blinded in this study.
Blinding of outcome assessment (detection bias)	Low risk.	Quote: "Analyses were performed by laboratory personnel blind to the patients' randomization." Comment: Low risk of detection bias
Incomplete outcome data addressed (attrition bias)	Low risk.	Quote: "Data were carefully inspected to identify missing data and outliers and to assess normality. No significant outliers were found and no missing data imputation was performed." Comment: Similar reasons for missing data across groups and similar rates of dropout
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Comment: Insufficient information.

Savard et al. (2005)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Unclear risk.	Quote: "Participants were randomly assigned to one of the two following conditions: CBT or waiting-list control condition (WLC)." Comment: Specific randomization procedure not specified.
Allocation concealment (selection bias)	Unclear risk.	Comment: Not mentioned in the article.
Blinding of participants and personnel (performance bias)	High risk.	Comment: The allocated intervention is unable to be blinded in this study.
Blinding of outcome assessment (detection bias)	Low risk.	Quote: "The sleep stages were scored in 30-second epochs, using standard criteria by an experienced technician who was blinded to the patient's experimental condition." Comment: Low risk of detection bias
Incomplete outcome data addressed (attrition bias)	Unclear risk.	Comment: Not mentioned in the article.
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Comment: Insufficient information.

Shadick et al. (2013)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Low risk.	Quote: "Subjects were randomized by a computer algorithm and assigned by the project manager who had no direct patient contact."

		Comment: Probably done.
Allocation concealment (selection bias)	Unclear risk.	Comment: Not mentioned in the article.
Blinding of participants and personnel (performance bias)	High risk.	Comment: The allocated intervention is unable to be blinded in this study.
Blinding of outcome assessment (detection bias)	Low risk.	Quote: "RA disease activity was evaluated by rheumatologists blinded to group assignment who assessed joint swelling and tenderness in 28 joints." Comment: Low risk of detection bias
Incomplete outcome data addressed (attrition bias)	Low risk.	Quote: "There were no differences in the baseline clinical, demographic, or outcome values between study completers versus those who dropped out" Comment: Missing outcome data balanced in numbers across intervention groups, with similar reasons for missing data across groups.
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Comment: Insufficient information.

Sharpe & Schrieber (2012)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Low risk.	Quote: "Patients were randomly allocated to treatment groups by simple randomization that was determined according to a standard table of random numbers generated by the Bernoulli function. The set of random numbers was related to a list of consecutive numbers." Comment: Probably done.
Allocation concealment (selection bias)	Low risk.	Quote: "After a participant completed the pre-treatment assessment, a researcher not involved in the assessment gave each participant a consecutive number and revealed the treatment to which the participant had been randomized. Randomization was concealed until after assessment." Comment: Probably done.
Blinding of participants and personnel (performance bias)	High risk.	Comment: The allocated intervention is unable to be blinded in this study.
Blinding of outcome assessment (detection bias)	Low risk.	Quote: "All assessors remained blind to the allocation throughout the intervention and follow-up." Quote: "The tapes were reviewed by a clinical psychologist with 20 years' experience specializing in RA, who was blind to the treatment condition" Comment: Probably done.

Incomplete outcome data addressed (attrition bias)	Low risk.	Quote: "There was no difference in attrition between the conditions, nor differences between drop-outs and completers." Comment: Missing outcome data balanced in numbers across intervention groups, with similar reasons for missing data across groups.
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Comment: Insufficient information.

Sharpe et al. (2001)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Low risk.	Quote: "Order of randomization was determined according to a standard table of random numbers." Comment: Probably done.
Allocation concealment (selection bias)	Unclear risk.	Comment: Not mentioned in the article.
Blinding of participants and personnel (performance bias)	High risk.	Quote: "Participants and those administering the intervention were unable to be blind due to the nature of the intervention." Comment: The allocated intervention is unable to be blinded in this study.
Blinding of outcome assessment (detection bias)	Low risk.	Quote: "All assessments were administered and scored by a research nurse (B.R.) blind to the condition to which each participant had been allocated." Quote: "participants were reassessed by the rheumatology nurse, who remained blind to the allocation of participants to groups" Comment: Probably done.
Incomplete outcome data addressed (attrition bias)	High risk.	Quote: "Drop-outs were equally distributed between the CBT and Standard groups. Drop-outs had higher levels of active disease, based on C-reactive protein levels. There was also a tendency for drop-outs to be younger, more depressed and have a higher level of joint dysfunction than those completing treatment." Comment: Differences between those who completed study and dropouts
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Comment: Insufficient information.

Shen et al. (2018)

Bias	Judgment	Support for judgment
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Random sequence generation (selection bias)	Low risk.	Quote: "we randomly assigned the participants at a ratio of 1:1 to either the experimental or a control group by random sequence number generation." Comment: Probably done.
Allocation concealment (selection bias)	Unclear risk.	Comment: Not mentioned in the article.
Blinding of participants and personnel (performance bias)	High risk.	Quote: "Participants and those administering the intervention were unable to be blind due to the nature of the intervention." Comment: The allocated intervention is unable to be blinded in this study.
Blinding of outcome assessment (detection bias)	Low risk.	Quote: "Data were analysed using the PASW Statistic 17.0 Programme (SPSS Inc., Chicago, IL, USA) by another researcher who was blinded to the allocation." Comment: Probably done.
Incomplete outcome data addressed (attrition bias)	Low risk.	Quote: "For all analyses, missing data were transformed by mean imputation" Comment: Missing data have been imputed using appropriate methods.
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Comment: Insufficient information.

Simoni et al. (2013)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Low risk.	Quote: "An external statistician had used a computerized random number generator to select random permuted blocks of four." Comment: Probably done.
Allocation concealment (selection bias)	Low risk.	Quote: "Allocation concealment involved the use of sequentially numbered, opaque, sealed envelopes containing the study arm assignment, which study staff opened at the moment of randomization after baseline assessment." Comment: Probably done.
Blinding of participants and personnel (performance bias)	High risk.	Quote: "Due to the nature of the intervention, participants and interventionists could not be blinded to study arm assignment, but to the extent possible, study staff performing subsequent assessments were." Comment: The allocated intervention is unable to be blinded in this study.
Blinding of outcome assessment (detection bias)	Low risk.	Quote: "The primary depressive symptoms outcomes were assessed with self-report and a semi-structured interview by an independent rater blind to treatment condition." Comment: Probably done.

Incomplete outcome data addressed (attrition bias)	High risk.	Quote: "To assess for differences between participants with complete self-report data (83 %) and those who missed one or more assessments (17 %), Fisher's exact x2 tests and Satterthwaite t tests for unequal variances were conducted, respectively, on categorical and continuous socio-demographic characteristics and baseline levels of the outcomes. Participants with missing self-report data, compared to those with complete data, were more likely to be English speaking; were younger; and were more recently diagnosed, in years, with HIV." Comment: Differences in those with missing data and those without missing data
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Comment: Insufficient information.

Taylor et al. (2009)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Unclear risk.	Quote: "8 depressed participants with elevated cardiovascular risk factors were randomized to a cognitive behavioral intervention (CBT) or a waiting list control (WLC) condition" Comment: Specific randomization procedure not specified.
Allocation concealment (selection bias)	Unclear risk.	Comment: Not mentioned in the article.
Blinding of participants and personnel (performance bias)	High risk.	Comment: The allocated intervention is unable to be blinded in this study.
Blinding of outcome assessment (detection bias)	Low risk.	Quote: "Interviewers were blind to the participants randomization status at post-test." Quote: "All measures were collected by research assistants blinded to the subjects randomization or depression status" Comment: Probably done.
Incomplete outcome data addressed (attrition bias)	Low risk.	Comment: Similar reasons for dropout across groups (2 vs 3 unresponsive to researcher contact).
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Comment: Insufficient information.

Theeke et al. (2016)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Unclear risk.	Quote: "participants were randomized into either LISTEN group or educational attention control group" Comment: Randomization procedure not specified.

Allocation concealment (selection bias)	Unclear risk.	Comment: Not mentioned in the article.
Blinding of participants and personnel (performance bias)	High risk.	Comment: The allocated intervention is unable to be blinded in this study.
Blinding of outcome assessment (detection bias)	Unclear risk.	Comment: Not mentioned in the article.
Incomplete outcome data addressed (attrition bias)	Unclear risk.	Comment: Not mentioned in the article.
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Comment: Insufficient information.

Thornton et al. (2009)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Unclear risk.	Quote: "Patients (N=227) were randomized to Intervention and assessment (n=114) versus Assessment only (n=113) arms" Comment: Randomization method not mentioned.
Allocation concealment (selection bias)	Unclear risk.	Comment: Not mentioned in the article.
Blinding of participants and personnel (performance bias)	High risk.	Comment: The allocated intervention is unable to be blinded in this study.
Blinding of outcome assessment (detection bias)	Low risk.	Quote: "A research nurse, blind to study arm assignment, completed two measures after a structured interview with the patient, chart/record review, and, if necessary, consultation with the patient's physician." Comment: Probably done.
Incomplete outcome data addressed (attrition bias)	Unclear risk.	Comment: Not mentioned in the article.
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Comment: Insufficient information.

Zautra et al. (2008)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Low risk.	Quote: "The project manager, under the supervision of the study's principal investigator (Alex J. Zautra), randomly assigned these clusters to one of three treatment conditions using a random numbers table."

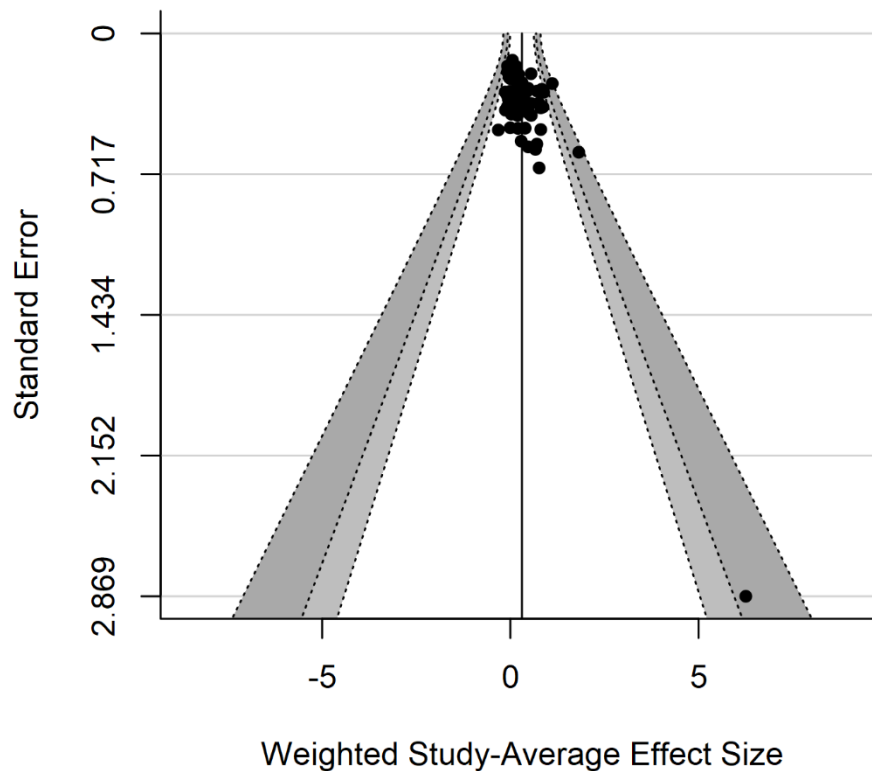
		Comment: Probably done.
Allocation concealment (selection bias)	Unclear risk.	Comment: Not mentioned in the article.
Blinding of participants and personnel (performance bias)	Low risk.	Quote: "Participants in the E group were recruited to join an 8-week group that provided information on ways to manage their arthritis, but they were not given descriptions of treatment alternatives. Thus, they were blind to alternative treatment conditions and hypotheses." Comment: Probably done.
Blinding of outcome assessment (detection bias)	Low risk.	Quote: "Research assistants, blind to treatment condition, were responsible for data collection." Comment: Probably done.
Incomplete outcome data addressed (attrition bias)	Low risk.	Quote: An examination of attrition, shown in the CONSORT diagram in Figure 1, revealed no differences between groups." Comment: Missing outcome data balanced in numbers across intervention groups, with similar reasons for missing data across groups.
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Comment: Insufficient information.

Zgierska et al. (2016)

Bias	Judgment	Support for judgment
Random sequence generation (selection bias)	Unclear risk.	Quote: "At the initial meeting, participants were first enrolled, and then completed baseline data collection, before being randomized." Comment: Randomization method not mentioned.
Allocation concealment (selection bias)	Low risk.	Quote: "52 randomization envelopes were prepared by a study statistician using the Minitab® Version 12 software and placed in sealed envelopes, blind to the researchers and participants. Envelopes were opened by participants in consecutive order after the completion of baseline assessments." Comment: Probably done.
Blinding of participants and personnel (performance bias)	High risk.	Quote: "Participants, intervention instructors, and outcome assessors were not blinded to the group assignment." Comment: High risk for performance bias.
Blinding of outcome assessment (detection bias)	High risk.	Quote: "Participants, intervention instructors, and outcome assessors were not blinded to the group assignment." Comment: High risk for detection bias.
Incomplete outcome data addressed (attrition bias)	Low risk.	Quote: "No participant withdrew from the study. They all provided baseline and at least one set of follow-up data on primary outcomes."

		Comment: Missing data is relatively small.
Selective reporting (reporting bias)	Low risk.	Comment: The published report includes all expected outcomes.
Other bias	Unclear risk.	Comment: Insufficient information.

eFigure. Funnel Plot Assessing Publication Bias in Selected Studies



Supplemental Figure 1. Funnel Plot Assessing Publication Bias in Selected Studies. Asymmetry of studies (the dots) around the grand effect (the middle line) indicates publication bias. Light gray indicates 95% confidence intervals whereas dark gray indicates 99% confidence intervals. There was significant publication bias in these studies ($p < .001$). However, the effect of psychosocial interventions on the immune system outcomes assessed remained significant when the missing studies were estimated and included ($p = .003$). There was one outlying effect, which we trimmed prior to conducting the primary analyses in order to prevent this study from unduly biasing any observed effects.